

EPA Comments on Polonium 210 on Bollards in Parcel D-1
Followup Comments to February 14, 2018, conference call with the Navy

The available data do not provide support for the theory that Po-210 is present at elevated levels on the bollards due entirely to environmental sources of Rn-222. In addition to the comments provided earlier, below are comments related to the February 14, 2018, conference call.

1. EPA has reviewed the documentation and composite gamma spectroscopy and alpha spectroscopy sample results for the 4 bollards rust samples.

Figure 2 in the Technical Memorandum from Gilbane dated January 23, 2018, shows the complete decay series for Rn-222, but it does not include the parent radionuclide Ra-226 (1600 year half-life) that would be necessary to establish any concentration of Rn-222, and is a contaminant of concern.

The beta/gamma survey data shows elevations wherever there was an alpha contamination (dpm/100cm²) greater than the release criteria (100 dpm/100cm²). The survey results are consistent with the presence of both beta/gamma and alpha emitters. The activity concentration lab result for Pb-210 (gamma spectroscopy result) is well above the detection limit and should be considered as a positive detection since its presence is confirmed by the Po-210 (alpha spectroscopy) result.

2. The MDC for Ra-226 was about 2.2 pCi/g, which is significantly above the Pb-210 concentrations. Some Ra-226 could be present but not detected. Ra-226 had to be “nearby” on the bollard to elevate the Pb-210 and Po-210 at some point in the past. Please note that not all of the “rust” was removed from the 100 cm² area, so the activity is likely to be under-reported.
3. The Gilbane memo concludes that Ra-226 is not present in the paint chip sample analyzed by gamma spectroscopy because it is not reported as being detected, based on the non-detect result for the daughter Bi-214. The Gilbane memo uses this apparent non-detect result as support for the theory that Po-210 is not present on the bollards due to site activities, rather than that it is present strictly due to environmental sources of radon. However, the gamma spectroscopy analysis reports the presence of Lead-214 at 0.324 pCi/g. Bi-214 is not reported but the Bi-214 MDC was elevated at 1.12 picoCuries per gram (pCi/g). Since Pb-214 and Bi-214 would be present at approximately the same concentrations from the decay of Ra-226, the Bi-214 would not have been able to be detected since the Bi-214 MDC was elevated at a level greater than 0.324 pCi/g. Therefore, the Bi-214 (and therefore Ra-226) was most likely present in the sample but just not reported as detected due to the elevated Bi-214 MDC. Therefore, the data provided in the technical memorandum does not support a conclusion that Po-210 was present due only to the naturally occurring environmental atmospheric sources of Rn-222.
4. The Navy’s argument that the Po-210 presence can only be from natural sources is not consistent with the 2004 Historical Radiological Assessment (HRA) for this berth area

that contains Ra-226 as a radionuclide of concern. The Pb-210 has a 22 year half-life that would continue to decay to Po-210; Since these nuclides would remain long after any NDRL Ra-226 was removed from the berth areas/shipyard, it would not be accurate to assume that all Po-210 above the release criteria was due to natural radon daughter products.

5. Normally close to the shoreline, naturally occurring radon is not as high a concern compared to inland due to the presence of water.
6. The Navy asked about the potential risk of exposure to Po-210. The greatest risk would be to ingestion/inhalation of any rust scale. The City's future plans for the shoreline at HPNS is recreational use. EPA had previously provided comment about the concern of exposure to a child who could touch the bollard surface and then ingest the contaminant. If the bollard is moved or removed during construction of recreational amenities, then future workers could handle the bollard and ingest the contaminant.
7. The Tetra Tech EC Inc. 2013 document cited in Appendix A does not conclude that Po-210 is the likely source of elevated alpha counts. Further, that document only cites Mound, Fernald and the Oak Ridge K-25 site as locations where Po-210 was plated out on metal structures. Based on the San Francisco Area Radon study, the levels of Rn-222 at Hunters Point are orders of magnitude lower than at those sites, so Po-210 plating out on metal structures due to naturally occurring Rn-222 is unlikely.
8. Even if Po-210 is not already listed in the Record of Decision (ROD) for Parcel D-1, radionuclides (including radon) are a hazardous substance under 40 CFR 302.4: <https://www.gpo.gov/fdsys/pkg/CFR-2004-title40-vol26/pdf/CFR-2004-title40-vol26-sec302-4.pdf> (see page 297). If a release or threat of release of a hazardous substance is found, EPA is authorized to act pursuant to Section 104 to remove it, and EPA can order a responsible party to remove it.
9. Removal of the rust and repainting of the bollards is the most cost-effective solution and would leave no question as to whether any residual radionuclide contamination above the release criteria was due to Navy activities on the shipyard.